# 96M5947/46

## Intel® Atom® 945GSE

## Mini-ITX Motherboard

# USER'S MANUAL

**Version 1.1**

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# Introduction

## Product Description

The 96M5947 Mini ITX board incorporates the Intel® 945GSE Express Chipset with ICH7M, configured with the Intel Atom processor N270 at 1.6GHz, FSB533 and the Mobile Intel 945GSE Express Chipset with the ICH7M.

The 96M5947 Mini ITX board features the Intel's Graphics Media Accelerator 950 core, making it compatible with Windows Vista Premium, and Chrontel CH7307 DVI accelerator to support display interfaces including VGA CRT, dual channel LVDS and a DVI port.

The new Intel® Graphics Media Accelerator 950 (Intel® GMA 950) graphics core is an intelligent and responsive graphics engine built into the chipset that is on the motherboard. This integration provides incredible visual quality, faster graphics performance and flexible display options without the need for a separate graphics card.

The main features of the 96M5947 Mini ITX Motherboard are:

- Supports Intel Atom 270 processor with 1.6GHz speed
- Two DDRII SDRAM DIMM supports up to 2GB of DDR2 400/533MHz memory
- Onboard 10/100 BaseT and Intel 82574L PCI-Express Gigabit LAN
- Intel® 945GSE VGA for CRT, LVDS, DVI
- 2x SATA, 8x USB 2.0, 4x COM, Watchdog timer
- 1x PCI, 1x MiniPCIe, CF socket, DC-in for +12V/+19V input

Dimensions of the board are 170mm x 170mm.

Ordering Information:

**96M5947**: Intel Atom, 1.6GHz, 945GSE chipset with DVI, LVDS, 1x 10/100 LAN, *1x Gigabit LAN*, Mini PCI-E, PCI

**96M5946**: Intel Atom, 1.6GHz, 945GSE chipset with DVI, LVDS, 1x 10/100 LAN, Mini PCI-E, PCI

# Checklist

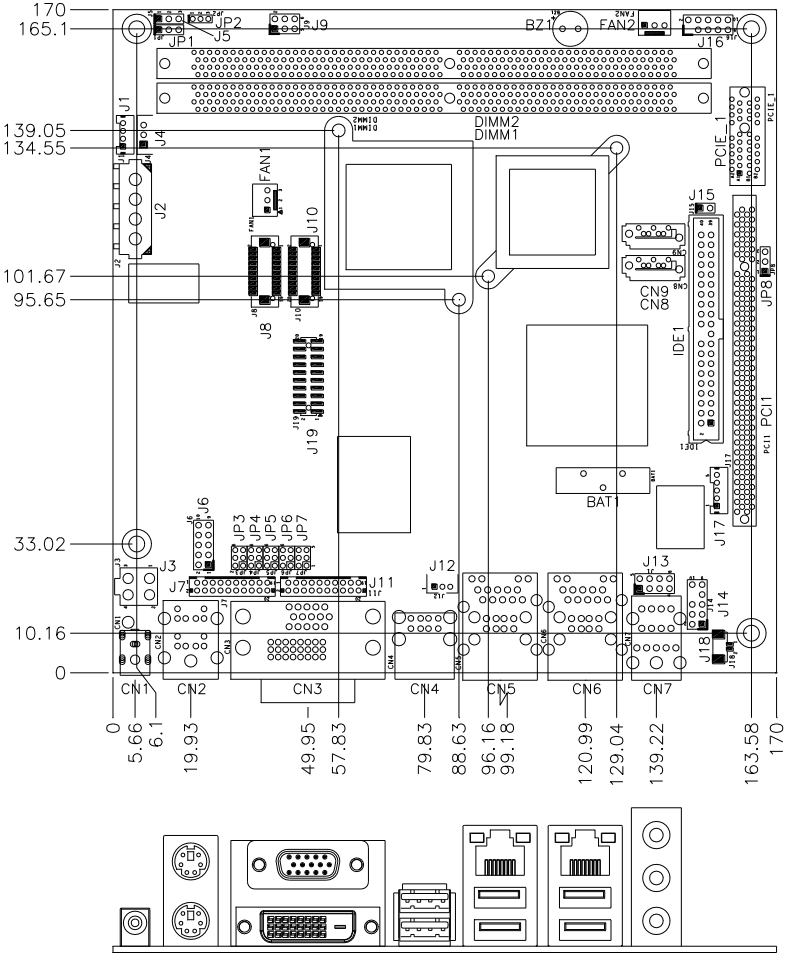
Your 96M5947 package should include the items listed below.

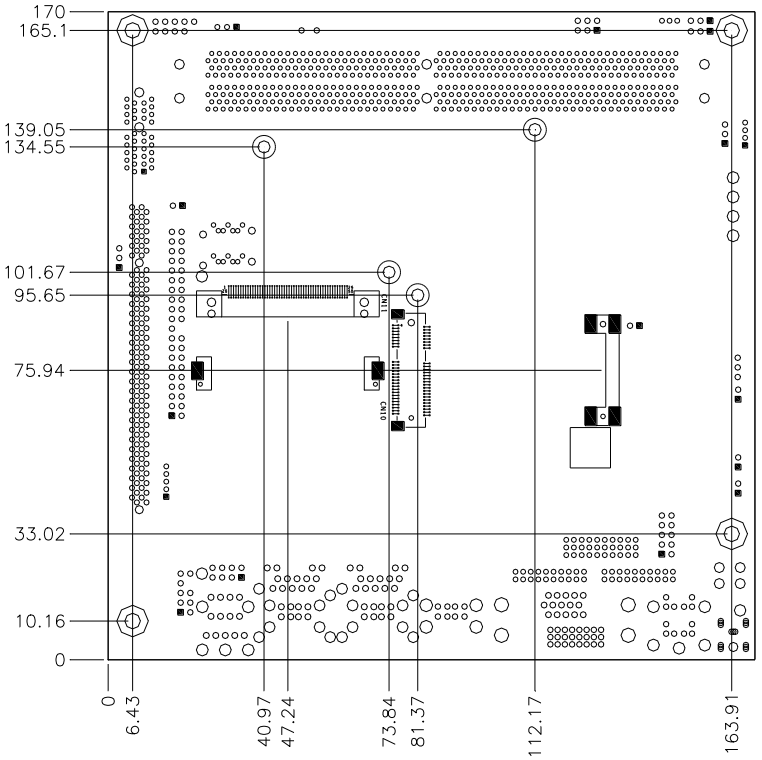
- The 96M5947 Intel® Atom Mini-ITX motherboard
- This User"s Manual
- 1 CD containing chipset drivers and flash memory utility
- Cable kit (IDE, 2x Serial port, Serial ATA, Parallel port)

# 96M5947 Specifications

| | |
|---|---|
| CPU Type | Intel New architecture CPU on 45nm processor,<br>Intel® Atom™ processor N270, 1.60GHz<br>L2 Cache=512K |
| FSB | 533MHz |
| Green /APM | APM1.2 |
| BIOS | Award BIOS, support ACPI Function |
| Chipset | INTEL 945GSE Chipset<br>GMCH: 82945GSE 27 mm x 27 mm -998-pin FCBGA<br>ICH7M: 82801GBM 31mm x 31mm -652-pin BGA |
| Memory | DDRII 533 DIMM x 2<br>(w/o ECC function), supports single channel. Max. 2GB |
| VGA | 945GSE built-in, Intel® Graphics Media Accelerator 950 Graphics Core, Supports CRT & 18 bits dual channels LVDS interface w/ DF13 socket x2 |
| DVI onboard | Chrontel CH7307C for DVI with connector on edge |
| LAN | 1. ICH7M built-in 10/100BT MAC + Intel 82562ET PHY<br>2. Intel 82574L PCI Express Gigabit LAN controller x1 |
| USB (Universal Serial Bus) | ICH7M built-in USB 2.0 host controller, support 8 ports |
| Serial ATA Ports | ICH7M built-in SATA controller, supports 2 ports |
| Parallel IDE | ICH7M built-in one channel Ultra DMA 33/66/100, CF |
| Audio | ICH7M Built-in Audio controller ALC 662 5.1-Channel (Line-in, Line-out & MIC) |
| LPC I/O | Winbond W83627EHG: COM1(RS232), COM2 (RS232/422/485), Hardware monitor (3 thermal inputs, 4 voltage monitor inputs, VID0-4 & 2 Fan Headers), LPT |
| 2nd LPC I/O | Fintek F81216DG COM3 &COM4(RS232) |
| Digital IO | 4 in & 4 out |
| Keyboard/Mouse Connector | Supports PS/2 Keyboard/Mouse |
| Expansion Slots | PCI slot x1, PCI-E (x1) slot x1 and Mini PCI-E (x1) socket x1 |
| Power Connector | DC Power jack x1 for +12V/+19V DC-in |
| Edge Connector | DC-IN jack<br>PS/2 Connector x1 for keyboard/mouse<br>VGA+DVI-D stack connector<br>Dual USB stack connector<br>10/100 LAN RJ45 + dual USB stack connector<br>Gigabit LAN RJ-45 + dual USB stack connector<br>3x1 stack mini jacks for HD audio (Line-in, Line-Out, Mic) |
| On Board Header/Connector | 40-pin box-header x1 for IDE1<br>CF Connector x1 @ solder side<br>10-pin header x1 for Digital I/O<br>20-pin DF11 connector x2 for COM1/COM2, COM3/COM4 (Pin9 can be powered with 5V or 12V or as ring-in)<br>8-pin header x 1 for USB7,8<br>10-pin header x1 for audio Line-Out & Microphone<br>SATA connector x2 for 2 SATA ports<br>DF13 connector x2 for LVDS<br>20-pin header for parallel port |
| Watchdog Timer | Yes (256 segments, 0, 1, 2…255 sec/min) |
| Other | Modem Wakeup, LAN Wakeup |
| RoHS | Yes |
| Board Size | 170mm x 170mm |

# Board Dimensions




170
165.1
139.05
134.55
101.67
95.65
75.94
33.02
10.16
0
0
6.43
40.97
47.24
73.84
81.37
112.17
163.91

# Installations

This section provides information on how to use the jumpers and connectors on the 96M5947 in order to set up a workable system. The topics covered are:

Installing the Memory ..... 7
Setting the Jumpers ..... 8
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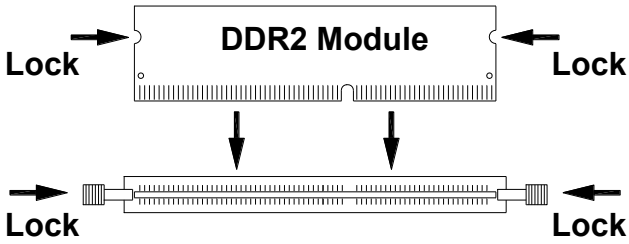
# Installing the Memory

The 96M5947 board supports two DDR2 memory socket for a maximum total memory of 2GB in DDR2 memory type.

**Installing and Removing Memory Modules**

To install the DDR2 modules, locate the memory slot on the board and perform the following steps:

1. Hold the DDR2 module so that the key of the DDR2 module align with those on the memory slot.
2. Gently push the DDR2 module in an upright position until the clips of the slot close to hold the DDR2 module in place when the DDR2 module touches the bottom of the slot.
3. To remove the DDR2 module, press the clips with both hands.



# Setting the Jumpers

Jumpers are used on 96M5947 to select various settings and features according to your needs and applications. Contact your supplier if you have doubts about the best configuration for your needs. The following lists the connectors on 96M5947 and their respective functions.

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JP2: ATX/AT Mode Select ..... 10
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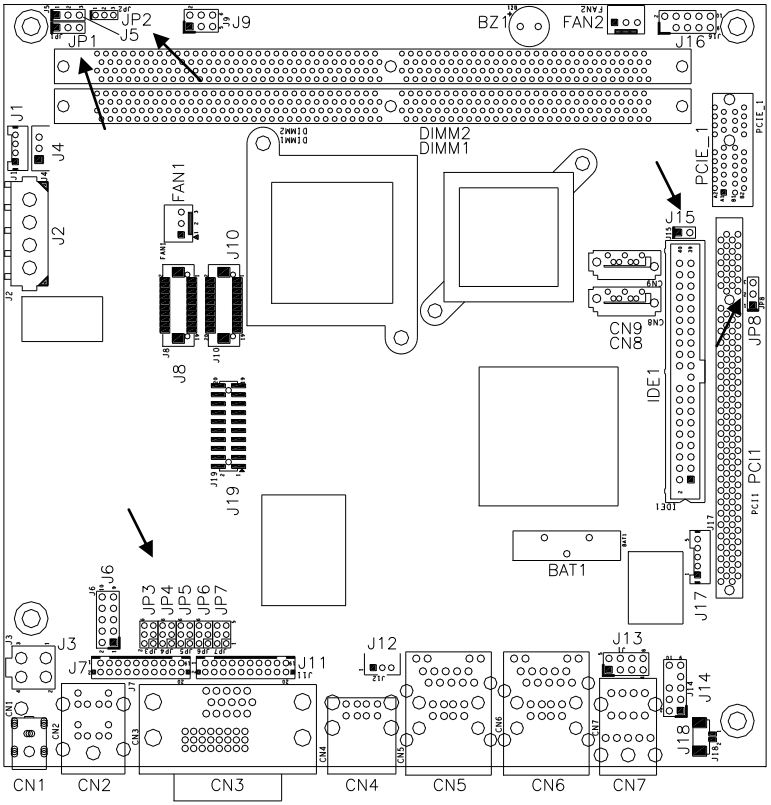
## Jumper Locations on 96M5947

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### JP1: LCD Panel Power Selection

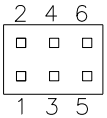
| JP1 | LCD Panel Power |
|---|---|
| | 3.3V |
| | 5V |

### JP2: ATX/AT Mode Select

| JP2 | ATX / AT |
|---|---|
| | ATX mode |
| | AT mode |

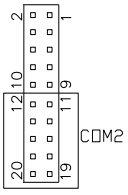
### JP3, JP4, JP5: RS232/422/485 (COM2) Selection

COM1/3/4 is fixed for RS-232 use only.
COM2 is selectable for RS232, RS-422 and RS-485.
The following table describes the jumper settings for COM2 selection.




| COM2 Function | RS-232 | RS-422 | RS-485 |
|---|---|---|---|
| Jumper Setting (pin closed) | JP5: 1-2<br>JP4: 3-5 & 4-6<br>JP3: 3-5 & 4-6 | JP5: 3-4<br>JP4: 1-3 & 2-4<br>JP3: 1-3 & 2-4 | JP5: 5-6<br>JP4: 1-3 & 2-4<br>JP3: 1-3 & 2-4 |

COM2 is jumper selectable for RS-232, RS-422 and RS-485.




| Pin # | Signal Name | | |
|---|---|---|---|
| | RS-232 | R2-422 | RS-485 |
| 11 | DCD | TX- | DATA- |
| 13 | RX | TX+ | DATA+ |
| 15 | TX | RX+ | NC |
| 17 | DTR | RX- | NC |
| 19 | Ground | Ground | Ground |
| 12 | DSR | RTS- | NC |
| 14 | RTS | RTS+ | NC |
| 16 | CTS | CTS+ | NC |
| 18 | RI | CTS- | NC |
| 20 | NC | NC | NC |

### JP6: COM4 RS232 +5V / +12V Power Setting

| Pin # | Signal Name | JP6 | Signal Name | Pin # |
|---|---|---|---|---|
| 1 | RI | | +12V | 2 |
| 3 | RI (Default) | | RI (Default) | 4 |
| 5 | RI | | +5V | 6 |



COM4 Settings: Pin 1-2 short = +12V, Pin 5-6 short = +5V, Pin 3-4 Standard COM Port

### JP7: COM3 RS232 +5V / +12V Power Setting

| Pin # | Signal Name | JP6 | Signal Name | Pin # |
|---|---|---|---|---|
| 1 | RI | | +12V | 2 |
| 3 | RI (Default) | | RI (Default) | 4 |
| 5 | RI | | +5V | 6 |



COM3 Settings: Pin 1-2 short = +12V, Pin 5-6 short = +5V, Pin 3-4 Standard COM Port

### JP8: Clear CMOS Setting

| JP8 | Setting |
|---|---|
| | Normal |
| | Clear CMOS |



### J15: CompactFlash Slave/Master Selection

| J15 | CF Setting |
|---|---|
| | Master |
| | Slave |

# Connectors on 96M5947

The connectors on 96M5947 allows you to connect external devices such as keyboard, floppy disk drives, hard disk drives, printers, etc. The following table lists the connectors on 96M5947 and their respective functions.

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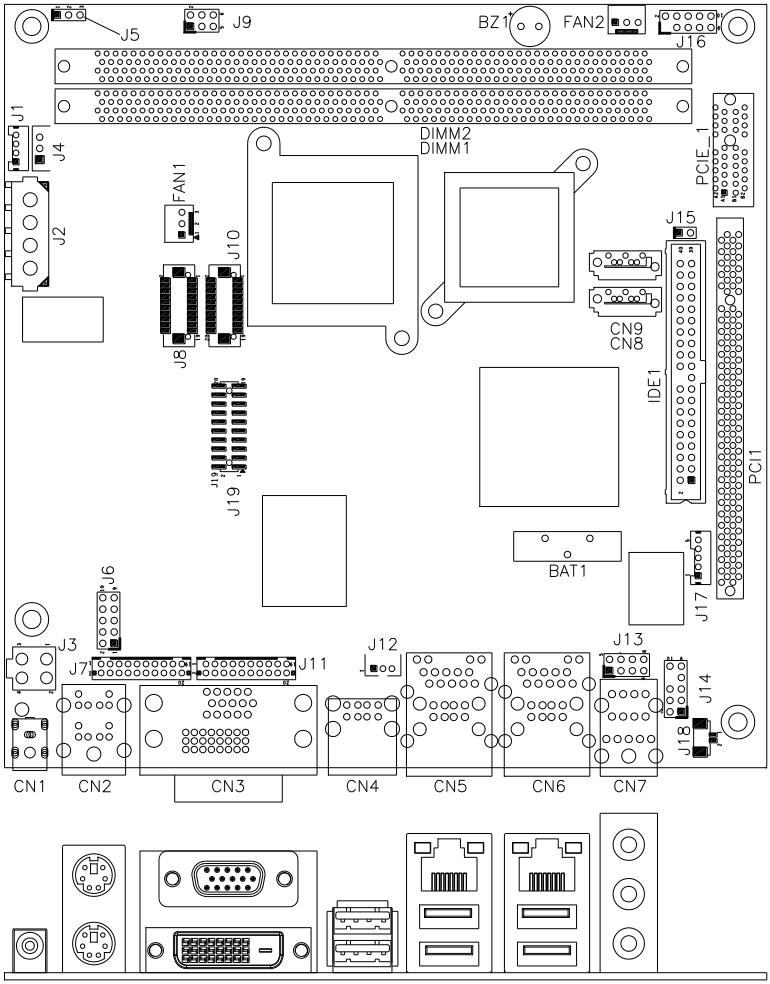
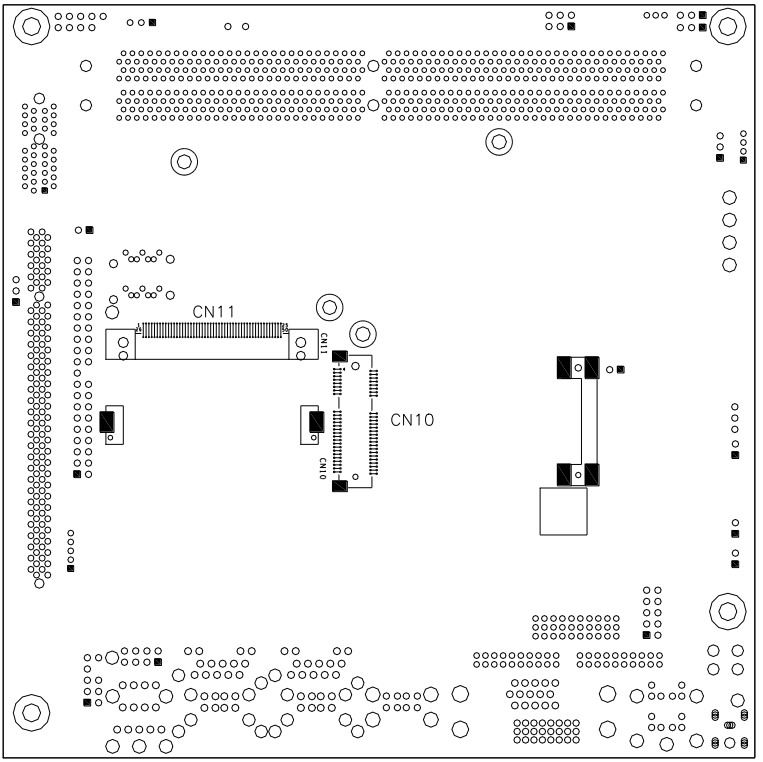
J17: Smart Battery Connector ..... 21
J18: SPDIF Out Connector ..... 21
J19: Parallel Port ..... 21

## Connector Locations on 96M5947




CN11
CN11
CN10
CN10

### FAN1: CPU Fan Power Connector

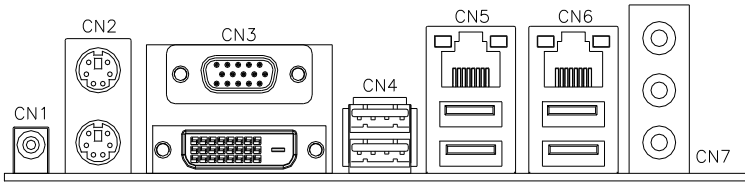
FAN1 is a 3-pin header for the CPU fan. The fan must be 12V (Max. 500mA).

| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Rotation detection |

### FAN2: System Fan Power Connector

FAN2 is a 3-pin header for system fans. The fan must be 12V (Max. 500mA).

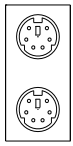
| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | +12V |
| 3 | Rotation detection |




### CN1: DC Jack (DC in, 12V or 19V)

***Remarks***: CN1 and J3 cannot be connected at the same time.

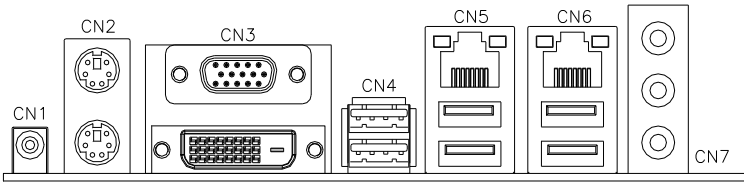
### CN2: PS/2 Keyboard and PS/2 Mouse Connectors



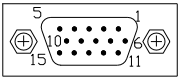
PS/2 Mouse

PS/2 Keyboard

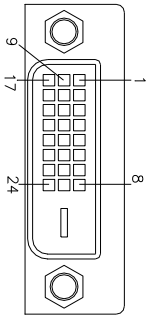
| Signal Name | Keyboard | Mouse | Signal Name |
|---|---|---|---|
| Keyboard data | 1 | 1 | Mouse data |
| N.C. | 2 | 2 | N.C. |
| GND | 3 | 3 | GND |
| 5V | 4 | 4 | 5V |
| Keyboard clock | 5 | 5 | Mouse clock |
| N.C. | 6 | 6 | N.C. |




### CN3: VGA and DVI Connectors




| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| Red | 1 | 2 | Green |
| Blue | 3 | 4 | N.C. |
| GND | 5 | 6 | GND |
| GND | 7 | 8 | GND |
| VCC | 9 | 10 | GND |
| N.C. | 11 | 12 | DDCDATA |
| HSYNC | 13 | 14 | VSYNC |
| DDCCLK | 15 | | |




| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| DATA 2- | 1 | 16 | HOT POWER |
| DATA 2+ | 2 | 17 | DATA 0- |
| Shield 2/4 | 3 | 18 | DATA 0+ |
| DATA 4- | 4 | 19 | SHIELD 0/5 |
| DATA 4+ | 5 | 20 | DATA 5- |
| DDC CLOCK | 6 | 21 | DATA 5+ |
| DDC DATA | 7 | 22 | SHIELD CLK |
| VSYNC | 8 | 23 | CLOCK - |
| DATA 1- | 9 | 24 | CLOCK + |
| DATA 1+ | 10 | | |
| SHIELD 1/3 | 11 | | |
| DATA 3- | 12 | | |
| DATA 3+ | 13 | | |
| DDC POWER | 14 | | |
| A GROUND 1 | 15 | | |

### CN4: USB5/6 Ports

### CN5: 10/100 RJ-45 and USB1/2 Ports

### CN6: GbE RJ-45 and USB3/4 Ports

### CN7: Audio Connector

**CN8, CN9: Serial ATA Connectors**

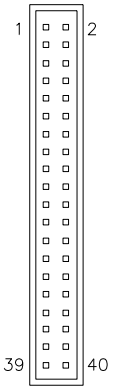
**CN10: Mini PCI- E(x1) Connector (bottom side)**

**CN11: Compact Flash Connector (bottom side)**

**PCI1: PCI Slot (supports 2 Master)**

**PCIE_1: PCIE x1 Slot**

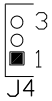
**IDE1: IDE Connector**




| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| Reset IDE | 1 | 2 | Ground |
| Host data 7 | 3 | 4 | Host data 8 |
| Host data 6 | 5 | 6 | Host data 9 |
| Host data 5 | 7 | 8 | Host data 10 |
| Host data 4 | 9 | 10 | Host data 11 |
| Host data 3 | 11 | 12 | Host data 12 |
| Host data 2 | 13 | 14 | Host data 13 |
| Host data 1 | 15 | 16 | Host data 14 |
| Host data 0 | 17 | 18 | Host data 15 |
| Ground | 19 | 20 | Protect pin |
| DRQ0 | 21 | 22 | Ground |
| Host IOW | 23 | 24 | Ground |
| Host IOR | 25 | 26 | Ground |
| IOCHRDY | 27 | 28 | Host ALE |
| DACK0 | 29 | 30 | Ground |
| IRQ14 | 31 | 32 | No connect |
| Address 1 | 33 | 34 | No connect |
| Address 0 | 35 | 36 | Address 2 |
| Chip select 0 | 37 | 38 | Chip select 1 |
| Activity | 39 | 40 | Ground |

### J1, J4: LCD Backlight Connector

| Pin # | Signal Name |
|---|---|
| 1 | +12V |
| 2 | Backlight Enable |
| 3 | Backlight ADJ |
| 4 | Ground |




| Pin # | Signal Name |
|---|---|
| 1 | +12V |
| 2 | Backlight ADJ |
| 3 | Ground |

### J2: HDD Power Connector (Output: Max. 2A)

| Pin # | Signal Name |
|---|---|
| 1 | +12V |
| 2 | Ground |
| 3 | Ground |
| 4 | 5V |

Note: +12V power is provided with 2A maximum load.

### J3: ATX_12V Connector

J3 is a DC-in internal connector supporting +12V or +19V.

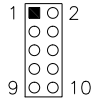
***Remarks***: CN1 and J3 connectors cannot be connected at the same time.

| Pin # | Signal Name |
|---|---|
| 1 | Ground |
| 2 | Ground |
| 3 | +12V |
| 4 | +12V |

### J5: Power LED Connector

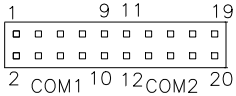
| Pin # | Signal Name |
|---|---|
| 1 | Vcc |
| 2 | NC |
| 3 | PLED |

### J6: Digital I/O




| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| GND | 1 | 2 | VCC |
| OUT3 | 3 | 4 | OUT1 |
| OUT2 | 5 | 6 | OUT0 |
| IN3 | 7 | 8 | IN1 |
| IN2 | 9 | 10 | IN0 |

### J7: COM1, COM2 Serial Ports

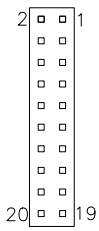



| Pin # | Signal Name (RS-232) |
|---|---|
| 1/11 | DCD, Data carrier detect |
| 3/13 | RXD, Receive data |
| 5/15 | TXD, Transmit data |
| 7/17 | DTR, Data terminal ready |
| 9/19 | Ground |
| 2/12 | DSR, Data set ready |
| 4/14 | RTS, Request to send |
| 6/16 | CTS, Clear to send |
| 8/18 | RI, Ring indicator |
| 10/20 | No Connect. |

*COM2 supports RS-232/422/485.

### J8, J10: LVDS Connectors (1st channel, 2nd channel)

The LVDS connectors on board consist of the first channel and second channel and supports 18-bit.



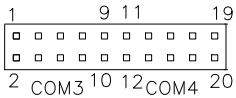

| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| TX0- | 2 | 1 | TX0+ |
| Ground | 4 | 3 | Ground |
| TX1- | 6 | 5 | TX1+ |
| 5V/3.3V | 8 | 7 | Ground |
| NC | 10 | 9 | NC |
| TX2- | 12 | 11 | TX2+ |
| Ground | 14 | 13 | Ground |
| TXC- | 16 | 15 | TXC+ |
| 5V/3.3V | 18 | 17 | ENABKL |
| +12V | 20 | 19 | +12V |

### J9: System Function Connector

| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| 5VDUAL | 1 | 2 | PS_ON |
| 5V | 3 | 4 | HDD Active |
| Ground | 5 | 6 | Reset |

ATX power on switch: Pins 1-2
HDD LED: Pins 3-4
Reset switch: Pins 5-6

### J11: COM3, COM4 Serial Ports




| Pin # | Signal Name (RS-232) |
|---|---|
| 1/11 | DCD, Data carrier detect |
| 3/13 | RXD, Receive data |
| 5/15 | TXD, Transmit data |
| 7/17 | DTR, Data terminal ready |
| 9/19 | Ground |
| 2/12 | DSR, Data set ready |
| 4/14 | RTS, Request to send |
| 6/16 | CTS, Clear to send |
| 8/18 | RI, Ring indicator |
| 10/20 | No Connect. |

### J12: Wake On LAN Connector

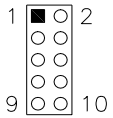
J12 is a 3-pin header for the Wake On LAN function.

| Pin # | Signal Name |
|---|---|
| 1 | +5VSB |
| 2 | Ground |
| 3 | -PME |

### J13: USB7/8 Port Pin Header

| Signal Name | Pin | Pin | Signal Name |
|---|---|---|---|
| Vcc | 1 | 5 | Ground |
| D- | 2 | 6 | D+ |
| D+ | 3 | 7 | D- |
| Ground | 4 | 8 | Vcc |

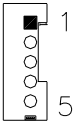
### J14: Audio Front Header




| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| MIC2_L | 1 | 2 | Ground |
| MIC2_R | 3 | 4 | Presence# |
| Line2_R | 5 | 6 | MIC2_ID |
| Sense | 7 | 8 | NC |
| Line2_L | 9 | 10 | Line2_ID |

### J16: SPI Debug Tools Port (Factory use only)

### J17: Smart Battery Connector



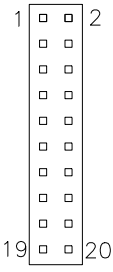

| Pin # | Signal Name |
|---|---|
| 1 | PCIRST- |
| 2 | EMTSMI- |
| 3 | Ground |
| 4 | SMBDATA |
| 5 | SMBCLK |

### J18: SPDIF Out Connector

| Pin # | Signal Name |
|---|---|
| 1 | SPDIF out |
| 2 | Ground |

### J19: Parallel Port (96M5947 only)

***Remarks: This connector is supported only in board version B1 and above.***




| Signal Name | Pin # | Pin # | Signal Name |
|---|---|---|---|
| STB- | 1 | 2 | BUSY |
| PD0 | 3 | 4 | PE |
| PD1 | 5 | 6 | SLCT |
| PD2 | 7 | 8 | AFD- |
| PD3 | 9 | 10 | ERR- |
| PD4 | 11 | 12 | INIT- |
| PD5 | 13 | 14 | SLIN- |
| PD6 | 15 | 16 | Ground |
| PD7 | 17 | 18 | Ground |
| ACK- | 19 | 20 | Protect Pin |

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# BIOS Setup

This chapter describes the different settings available in the Award BIOS that comes with the board. The topics covered in this chapter are as follows:

BIOS Introduction ..... 24
BIOS Setup ..... 24
Standard CMOS Setup ..... 26
Advanced BIOS Features ..... 29
Advanced Chipset Features ..... 32
Integrated Peripherals ..... 35
Power Management Setup ..... 39
PNP/PCI Configurations ..... 42
PC Health Status ..... 43
Frequency/Voltage Control ..... 44
Load Fail-Safe Defaults ..... 46
Load Optimized Defaults ..... 46
Set Supervisor/User Password ..... 46
Save & Exit Setup ..... 46
Exit Without Saving ..... 46

## BIOS Introduction

The Award BIOS (Basic Input/Output System) installed in your computer system"s ROM supports Intel processors. The BIOS provides critical low-level support for a standard device such as disk drives, serial ports and parallel ports. It also adds virus and password protection as well as special support for detailed fine-tuning of the chipset controlling the entire system.

## BIOS Setup

The Award BIOS provides a Setup utility program for specifying the system configurations and settings. The BIOS ROM of the system stores the Setup utility. When you turn on the computer, the Award BIOS is immediately activated. Pressing the <Del> key immediately allows you to enter the Setup utility. If you are a little bit late pressing the <Del> key, POST (Power On Self Test) will continue with its test routines, thus preventing you from invoking the Setup. If you still wish to enter Setup, restart the system by pressing the "Reset" button or simultaneously pressing the <Ctrl>, <Alt> and <Delete> keys. You can also restart by turning the system Off and back On again. The following message will appear on the screen:

```
Press  <DEL>  to  Enter  Setup
```

In general, you press the arrow keys to highlight items, <Enter> to select, the <PgUp> and <PgDn> keys to change entries, <F1> for help and <Esc> to quit.

When you enter the Setup utility, the Main Menu screen will appear on the screen. The Main Menu allows you to select from various setup functions and exit choices.

Phoenix - AwardBIOS CMOS Setup Utility

| | |
|---|---|
| Standard CMOS Features | Frequency/Voltage Control |
| Advanced BIOS Features | Load Fail-Safe Defaults |
| Advanced Chipset Features | Load Optimized Defaults |
| Integrated Peripherals | Set Supervisor Password |
| Power Management Setup | Set User Password |
| PnP/PCI Configurations | Save & Exit Setup |
| PC Health Status | Exit Without Saving |
| ESC : Quit<br>F10 : Save & Exit Setup | ↑ ↓ → ← : Select Item |
| Time, Date, Hard Disk Type… | |

The section below the setup items of the Main Menu displays the control keys for this menu. At the bottom of the Main Menu just below the control keys section, there is another section, which displays information on the currently highlighted item in the list.

***Note:*** *If the system cannot boot after making and saving system changes with Setup, the Award BIOS supports an override to the CMOS settings that resets your system to its default.*

***Warning:*** *It is strongly recommended that you avoid making any changes to the chipset defaults. These defaults have been carefully chosen by both Award and your system manufacturer to provide the absolute maximum performance and reliability. Changing the defaults could cause the system to become unstable and crash in some cases.*

## Standard CMOS Setup

"Standard CMOS Setup" choice allows you to record some basic hardware configurations in your computer system and set the system clock and error handling. If the motherboard is already installed in a working system, you will not need to select this option. You will need to run the Standard CMOS option, however, if you change your system hardware configurations, the onboard battery fails, or the configuration stored in the CMOS memory was lost or damaged.

Phoenix - AwardBIOS CMOS Setup Utility
Standard CMOS Features

| | | |
|---|---|---|
| Date (mm:dd:yy) | Fri, Mar 23, 2007 | Item Help |
| Time (hh:mm:ss) | 00 : 00 : 00 | Menu Level > |
| IDE Channel 0 Master | None | Change the day, month, |
| IDE Channel 0 Slave | None | Year and century |
| IDE Channel 1 Master | None | |
| IDE Channel 1 Slave | None | |
| Video | EGA/VGA | |
| Halt On | All, Errors | |
| Base Memory | 640K | |
| Extended Memory | 514048K | |
| Total Memory | 515072K | |

At the bottom of the menu are the control keys for use on this menu. If you need any help in each item field, you can press the <F1> key. It will display the relevant information to help you. The memory display at the lower right-hand side of the menu is read-only. It will adjust automatically according to the memory changed. The following describes each item of this menu.

### Date

The date format is:

| | |
|---|---|
| **Day :** | **Sun to Sat** |
| **Month :** | **1 to 12** |
| **Date :** | **1 to 31** |
| **Year :** | **1999 to 2099** |

To set the date, highlight the "Date" field and use the PageUp/ PageDown or +/- keys to set the current time.

### Time

The time format is: **Hour : 00 to 23**
**Minute : 00 to 59**
**Second : 00 to 59**

To set the time, highlight the "Time" field and use the <PgUp>/ <PgDn> or +/- keys to set the current time.

### IDE Channel Master/Slave

The onboard PCI IDE connector provides Primary and Secondary channels for connecting up to two IDE hard disks or other IDE devices.

Press <Enter> to configure the hard disk. The selections include Auto, Manual, and None. Select „Manual" to define the drive information manually. You will be asked to enter the following items.

| | |
|---|---|
| **Capacity :** | Capacity/size of the hard disk drive |
| **CYLS :** | Number of cylinders |
| **HEAD :** | Number of read/write heads |
| **PRECOMP :** | Write precompensation |
| **LANDING ZONE :** | Landing zone |
| **SECTOR :** | Number of sectors |

The Access Mode selections are as follows:

| | |
|---|---|
| CHS | (HD < 528MB) |
| LBA | (HD > 528MB and supports Logical Block Addressing) |
| Large | (for MS-DOS only) |
| Auto | |

**Remarks**: The main board supports two serial ATA ports and are represented in this setting as IDE Channel 0.

### Video

This field selects the type of video display card installed in your system. You can choose the following video display cards:

| | |
|---|---|
| EGA/VGA | For EGA, VGA, SEGA, SVGA or PGA monitor adapters. (default) |
| CGA 40 | Power up in 40 column mode. |
| CGA 80 | Power up in 80 column mode. |
| MONO | For Hercules or MDA adapters. |

### Halt On

This field determines whether or not the system will halt if an error is detected during power up.

| | |
|---|---|
| No errors | The system boot will not be halted for any error that may be detected. |
| All errors | Whenever the BIOS detects a non-fatal error, the system will stop and you will be prompted. |
| All, But Keyboard | The system boot will not be halted for a keyboard error; it will stop for all other errors |
| All, But Diskette | The system boot will not be halted for a disk error; it will stop for all other errors. |
| All, But Disk/Key | The system boot will not be halted for a keyboard or disk error; it will stop for all others. |

## Advanced BIOS Features

This section allows you to configure and improve your system and allows you to set up some system features according to your preference.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced BIOS Features

| | | |
|---|---|---|
| CPU Feature | Press Enter | ITEM HELP |
| Hard Disk Boot Priority | Press Enter | |
| Virus Warning | Disabled | Menu Level > |
| CPU L1 and L2 Cache | Enabled | |
| CPU L3 Cache | Enabled | |
| Hyper-Threading Technology | Enabled | |
| Quick Power On Self Test | Enabled | |
| First Boot Device | Hard Disk | |
| Second Boot Device | CDROM | |
| Third Boot Device | USB-FDD | |
| Boot Other Device | Enabled | |
| Swap Floppy Drive | Disabled | |
| Boot Up Floppy Seek | Disabled | |
| Boot Up NumLock Status | On | |
| Gate A20 Option | Fast | |
| Typematic Rate Setting | Disabled | |
| Typematic Rate (Chars/Sec) | 6 | |
| Typematic Delay (Msec) | 250 | |
| Security Option | Setup | |
| APIC Mode | Enabled | |
| MPS Version Control for OS | 1.4 | |
| OS Select For DRAM>64MB | Non-OS2 | |
| Report No FDD For WIN 95 | No | |
| Small Logo (EPA) Show | Disabled | |

### CPU Feature

Press Enter to configure the settings relevant to CPU Feature.

### Hard Disk Boot Priority

With the field, there is the option to choose, aside from the hard disks connected, “Bootable add-in Cards” which refers to other external devices.

### Virus Warning

If this option is enabled, an alarm message will be displayed when trying to write on the boot sector or on the partition table on the disk, which is typical of the virus.

### CPU L1 / L2 / L3 Cache

Cache memory is additional memory that is much faster than conventional DRAM (system memory). CPUs from 486-type on up contain internal cache memory, and most, but not all, modern PCs have additional (external) cache memory. When the CPU requests data, the system transfers the requested data from the main DRAM into cache memory, for even faster access by the CPU. These items allow you to enable (speed up memory access) or disable the cache function. By default, these items are Enabled.

### Hyper-Threading Technology
By default, this function is enabled.

### Quick Power On Self Test
When enabled, this field speeds up the Power On Self Test (POST) after the system is turned on. If it is set to *Enabled*, BIOS will skip some items.

### First/Second/Third Boot Device
These fields determine the drive that the system searches first for an operating system. The options available include *Floppy*, *LS120*, *Hard Disk*, *CDROM, ZIP100*, *USB-Floppy, USB-ZIP*, *USB-CDROM, LAN* and *Disable*.

### Boot Other Device
These fields allow the system to search for an OS from other devices other than the ones selected in the First/Second/Third Boot Device.

### Swap Floppy Drive
This item allows you to determine whether or not to enable Swap Floppy Drive. When enabled, the BIOS swaps floppy drive assignments so that Drive A becomes Drive B, and Drive B becomes Drive A. By default, this field is set to ***Disabled.***

### Boot Up Floppy Seek
This feature controls whether the BIOS checks for a floppy drive while booting up. If it cannot detect one (either due to improper configuration or its absence), it will flash an error message.

### Boot Up NumLock Status
This allows you to activate the NumLock function after you power up the system.

### Gate A20 Option
This field allows you to select how Gate A20 is worked. Gate A20 is a device used to address memory above 1 MB.

### Typematic Rate Setting
When disabled, continually holding down a key on your keyboard will generate only one instance. When enabled, you can set the two typematic controls listed next. By default, this field is set to ***Disabled.***

### Typematic Rate (Chars/Sec)
When the typematic rate is enabled, the system registers repeated keystrokes speeds. Settings are from 6 to 30 characters per second.

### Typematic Delay (Msec)
When the typematic rate is enabled, this item allows you to set the time interval for displaying the first and second characters. By default, this item is set to ***250msec.***

### Security Option
This field allows you to limit access to the System and Setup. The default value is ***Setup***. When you select *System,* the system prompts for the User Password every time you boot up. When you select *Setup,* the system always boots up and prompts for the Supervisor Password only when the Setup utility is called up.

### APIC Mode
APIC stands for Advanced Programmable Interrupt Controller. The default setting is ***Enabled***.

### MPS Version Control for OS
This option is specifies the MPS (Multiprocessor Specification) version for your operating system. MPS version 1.4 added extended configuration tables to improve support for multiple PCI bus configurations and improve future expandability. The default setting is ***1.4***.

### OS Select for DRAM > 64MB
This option allows the system to access greater than 64MB of DRAM memory when used with OS/2 that depends on certain BIOS calls to access memory. The default setting is ***Non-OS/2***.

### Report No FDD For WIN 95
If you are using Windows 95/98 without a floppy disk drive, select Enabled to release IRQ6. This is required to pass Windows 95/98's SCT test. You should also disable the Onboard FDC Controller in the Integrated Peripherals screen when there's no floppy drive in the system. If you set this feature to Disabled, the BIOS will not report the missing floppy drive to Win95/98.

### Small Logo (EPA) Show
The EPA logo appears at the right side of the monitor screen when the system is boot up. The default setting is ***Disabled***.

## Advanced Chipset Features

This Setup menu controls the configuration of the chipset.

Phoenix - AwardBIOS CMOS Setup Utility
Advanced Chipset Features

| | | |
|---|---|---|
| DRAM Timing Selectable | By SPD | ITEM HELP |
| CAS Latency Time | Auto | Menu Level > |
| DRAM RAS# to CAS# Delay | Auto | |
| DRAM RAS# Precharge | Auto | |
| Precharge delay (tRAS) | Auto | |
| System Memory Frequency | Auto | |
| SLP_S4# Assertion Width | 4 to 5 Sec | |
| System BIOS Cacheable | Enabled | |
| Video BIOS Cacheable | Disabled | |
| Memory Hole at 15M-16M | Disabled | |
| PCI Express Root Port Func | Press Enter | |
| | | |
| | | |
| ** On-Chip VGA Setting ** | | |
| On-Chip Frame Buffer Size | 8MB | |
| DVMT Mode | DVMT | |
| DVMT/FIXED memory Size | 128MB | |
| SDVO Device Setting | DVI | |
| Boot Display | CRT+DVI | |
| Panel Scaling | Auto | |
| Panel Number | 1024x768 18 bit SC | |

### DRAM Timing Selectable

This option refers to the method by which the DRAM timing is selected. The default is ***By SPD***.

### CAS Latency Time

You can configure CAS latency time in HCLKs as 2 or 2.5 or 3. The system board designer should set the values in this field, depending on the DRAM installed. Do not change the values in this field unless you change specifications of the installed DRAM or the installed CPU.

### DRAM RAS# to CAS# Delay

This option allows you to insert a delay between the RAS (Row Address Strobe) and CAS (Column Address Strobe) signals. This delay occurs when the SDRAM is written to, read from or refreshed. Reducing the delay improves the performance of the SDRAM.

### DRAM RAS# Precharge

This option sets the number of cycles required for the RAS to accumulate its charge before the SDRAM refreshes. The default setting for the Active to Precharge Delay is Auto.

### Precharge Delay (tRAS)
The default setting for the Precharge Delay is ***Auto***.

### System Memory Frequency
The default setting is ***Auto***.

### SLP_S4# Assertion Width
The default setting is ***4 to 5 Sec***.

### System BIOS Cacheable
The setting of *Enabled* allows caching of the system BIOS ROM at F000h-FFFFFh, resulting in better system performance. However, if any program writes to this memory area, a system error may result.

### Video BIOS Cacheable
The Setting *Enabled* allows caching of the video BIOS ROM at C0000h-F7FFFh, resulting in better video performance. However, if any program writes to this memory area, a system error may result.

### Memory Hole At 15M-16M
In order to improve performance, certain space in memory can be reserved for ISA cards. This memory must be mapped into the memory space below 16 MB. The choices are *Enabled* and *Disabled*.

### On-Chip VGA Setting
The fields under the On-Chip VGA Setting and their default settings are:

PEG/On Chip VGA Control: Auto
On-Chip Frame Buffer Size: 8MB
DVMT Mode: DVMT
DVMT/Fixed Memory Size: 128MB
SDVO Device Setting: DVI
Boot Display: CRT+DVI
Panel Scaling: Auto
Panel Number: 1024x768 18 bit SC

### Panel Scaling

The default setting is ***Auto***. The options available include *On* and *Off*.

### Panel Number

These fields allow you to select the LCD Panel type. The default values for these ports are:

| | |
|---|---|
| 640x480 | 18bit SC |
| 800x480 | 18bit SC |
| 800x600 | 18bit SC |
| 1024x768 | 18bit SC |
| 1280x768 | 18bit SC |
| 1280x800 | 18bit SC |
| 1366x768 | 18bit SC |

## Integrated Peripherals

This section sets configurations for your hard disk and other integrated peripherals. The first screen shows three main items for user to select. Once an item selected, a submenu appears. Details follow.

Phoenix - AwardBIOS CMOS Setup Utility
Integrated Peripherals

| | | |
|---|---|---|
| OnChip IDE Device | Press Enter | ITEM HELP |
| Onboard Device | Press Enter | Menu Level > |
| SuperIO Device | Press Enter | |
| 2nd SuperIO Device | Press Enter | |

Phoenix - AwardBIOS CMOS Setup Utility
**OnChip IDE Device**

| | | |
|---|---|---|
| IDE HDD Block Mode | Enabled | ITEM HELP |
| IDE DMA transfer access | Enabled | |
| On-chip Primary PCI IDE | Enabled | |
| IDE Primary Master PIO | Auto | Menu Level > |
| IDE Primary Slave PIO | Auto | |
| IDE Primary Master UDMA | Auto | |
| IDE Primary Slave UDMA | Auto | |
| On-Chip Secondary PCI IDE | Enabled | |
| IDE Secondary Master PIO | Auto | |
| IDE Secondary Slave PIO | Auto | |
| IDE Secondary Master UDMA | Auto | |
| IDE Secondary Slave UDMA | Auto | |
| | | |
| *** On-Chip Serial ATA Setting *** | | |
| On-Chip Serial ATA | Auto | |
| SATA Port Speed Settings | Disabled | |
| PATA IDE Mode | Primary | |
| SATA port | P1, P3 is Secondary | |

Phoenix - AwardBIOS CMOS Setup Utility
**Onboard Device**

| | | |
|---|---|---|
| USB Controller | Enabled | ITEM HELP |
| USB 2.0 Controller | Enabled | Menu Level > |
| USB Keyboard Function | Enabled | |
| USB Mouse Support | Enabled | |
| Azalia AC97 Audio Select | Auto | |

Phoenix - AwardBIOS CMOS Setup Utility
**SuperIO Device**

| | | |
|---|---|---|
| POWER ON Function | BUTTON ONLY | ITEM HELP |
| KB Power ON Password | Enter | |
| Hot Key power ON | Ctrl-F1 | |
| Onboard FDC Controller | Disabled | |
| Onboard Serial Port 1 | 3F8/IRQ4 | Menu Level > |
| Onboard Serial Port 2 | 2F8/IRQ3 | |
| PWRON After PWR-Fail | Off | |

Phoenix - AwardBIOS CMOS Setup Utility
**2nd Super IO Device**

| | | |
|---|---|---|
| Onboard Serial Port 3 | 2B0h | ITEM HELP |
| Serial Port 3 Use IRQ | IRQ11 | Menu Level > |
| Onboard Serial Port 4 | 2B8h | |
| Serial Port 4 Use IRQ | IRQ10a | |

### IDE HDD Block Mode
This field allows your hard disk controller to use the fast block mode to transfer data to and from your hard disk drive.

### IDE DMA Transfer Access
This field, by default, is enabled

### On-chip Primary PCI IDE Enabled
This field, by default, is enabled

### OnChip Primary/Secondary PCI IDE
The integrated peripheral controller contains an IDE interface with support for two IDE channels. Select *Enabled* to activate each channel separately.

### IDE Primary/Secondary Master/Slave PIO
These fields allow your system hard disk controller to work faster. Rather than have the BIOS issue a series of commands that transfer to or from the disk drive, PIO (Programmed Input/Output) allows the BIOS to communicate with the controller and CPU directly.

The system supports five modes, numbered from 0 (default) to 4, which primarily differ in timing. When Auto is selected, the BIOS will select the best available mode.

### IDE Primary/Secondary Master/Slave UDMA
These fields allow your system to improve disk I/O throughput to 33Mb/sec with the Ultra DMA/33 feature. The options are *Auto* and *Disabled*.

### On-Chip Serial ATA Setting

The fields under the SATA setting includes SATA Mode (IDE), On-Chip Serial ATA (Auto), PATA IDE Mode (Secondary) and SATA Port (PO, P2 is Primary).

### USB Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Enabled***.

### USB 2.0 Controller

The options for this field are *Enabled* and *Disabled*. By default, this field is set to ***Enabled***. In order to use USB 2.0, necessary OS drivers must be installed first. ***Please update your system to Windows 2000 SP4 or Windows XP SP2.***

### USB Keyboard Function

By default, the USB keyboard function is set to ***Enabled***.

### Azalia AC97 Audio Select

This field, by default, is set to ***Auto***. The selections are *Azalia*, *AC97 Audio and Modem*, *AC97 Audio only, AC97 Modem only*, and *All Disabled*.

### Power ON Function

This field is related to how the system is powered on – such as with the use of conventional power button, keyboard or hot keys. The default is ***BUTTON ONLY***.

### KB Power ON Password

This field allows users to set the password when keyboard power on is the mode of the Power ON function.

### Hot Key Power ON

This field sets certain keys, also known as hot keys, on the keyboard that can be used as a „switch" to power on the system.

### Onboard FDD Controller

By default, this field is disabled.

### Onboard Serial Port

These fields allow you to select the onboard serial ports and their addresses. The default values for these ports are:

| | |
|---|---|
| Serial Port 1 | 3F8/IRQ4 |
| Serial Port 2 | 2F8/IRQ3 |

### PWRON After PWR-Fail

This field sets the system power status whether *on or off* when power returns to the system from a power failure situation.

## Power Management Setup

Phoenix - AwardBIOS CMOS Setup Utility
Power Management Setup

| | | ITEM HELP |
|---|---|---|
| ACPI Function | Enabled | |
| ACPI Suspend | S1(POS) | |
| RUN VGABIOS if S3 Resume | Auto | Menu Level > |
| Power Management | User Define | |
| Video Off Method | DPMS | |
| Video Off In Suspend | Yes | |
| Suspend Type | Stop Grant | |
| Modem Use IRQ | 3 | |
| Suspend Mode | Disabled | |
| HDD Power Down | Disabled | |
| Soft-Off by PWR-BTTN | Instant-Off | |
| CPU THRM-Throttling | 75% | |
| Wake-Up by PCI Card | Disabled | |
| Power On by Ring | Disabled | |
| USB KB Wakeup from S3 | Disabled | |
| Resume by Alarm | Disabled | |
| Date (of Month) Alarm | 0 | |
| Time (hh:mm:ss) Alarm | 0 : 0 : 0 | |
| ** Reload Global Timer Events ** | | |
| Primary IDE 0 | Disabled | |
| Primary IDE 1 | Disabled | |
| Secondary IDE 0 | Disabled | |
| Secondary IDE 1 | Disabled | |
| FDD, COM, LPT Port | Disabled | |
| PCI PIRQ[A-D] # | Disabled | |

### ACPI Function

Enable this function to support ACPI (Advance Configuration and Power Interface).

### ACPI Suspend

The default setting of the ACPI Suspend mode is ***S1(POS)***.

### RUN VGABIOS if S3 Resume

The default setting of this field is ***Auto***.

### Power Management

This field allows you to select the type of power saving management modes. There are four selections for Power Management.

| | |
|---|---|
| Min. Power Saving | Minimum power management |
| Max. Power Saving | Maximum power management. |
| User Define | Each of the ranges is from 1 min. to 1hr. Except for HDD Power Down which ranges from 1 min. to 15 min. |

### Video Off Method
This field defines the Video Off features. There are three options.

| | |
|---|---|
| V/H SYNC + Blank | Default setting, blank the screen and turn off vertical and horizontal scanning. |
| DPMS | Allows BIOS to control the video display. |
| Blank Screen | Writes blanks to the video buffer. |

### Video Off In Suspend
When enabled, the video is off in suspend mode.

### Suspend Type
The default setting for the Suspend Type field is ***Stop Grant***.

### Modem Use IRQ
This field sets the IRQ used by the Modem. By default, the setting is ***3***.

### Suspend Mode
When enabled, and after the set time of system inactivity, all devices except the CPU will be shut off.

### HDD Power Down
When enabled, and after the set time of system inactivity, the hard disk drive will be powered down while all other devices remain active.

### Soft-Off by PWRBTN
This field defines the power-off mode when using an ATX power supply. The *Instant Off* mode allows powering off immediately upon pressing the power button. In the *Delay 4 Sec* mode, the system powers off when the power button is pressed for more than four seconds or enters the suspend mode when pressed for less than 4 seconds.

### Wake up by PCI Card
By default, this field is disabled.

### Power On by Ring
This field enables or disables the power on of the system through the modem connected to the serial port or LAN.

### USB KB Wakeup from S3
By default, this field is disabled.

### Resume by Alarm

This field enables or disables the resumption of the system operation. When enabled, the user is allowed to set the *Date* and *Time*.

### Reload Global Timer Events

The HDD, FDD, COM, LPT Ports, and PCI PIRQ are I/O events that can prevent the system from entering a power saving mode or can awaken the system from such a mode. When an I/O device wants to gain the attention of the operating system, it signals this by causing an IRQ to occur. When the operating system is ready to respond to the request, it interrupts itself and performs the service.

## PNP/PCI Configurations

This option configures the PCI bus system. All PCI bus systems on the system use INT#, thus all installed PCI cards must be set to this value.

Phoenix - AwardBIOS CMOS Setup Utility
PnP/PCI Configurations

| | | ITEM HELP |
|---|---|---|
| Init Display First | PCI Slot | |
| Reset Configuration Data | Disabled | Menu Level |
| Resources Controlled By | Auto (ESCD) | |
| IRQ Resources | Press Enter | Select Yes if you are using a Plug and Play capable operating system Select No if you need the BIOS to configure non-boot devices |
| PCI/VGA Palette Snoop | Disabled | |
| **PCI Express relative items** | | |
| Maximum Payload Size | 4096 | |

### Init Display First

The default setting is ***PCI Card***.

### Reset Configuration Data

This field allows you to determine whether to reset the configuration data or not. The default value is ***Disabled.***

### Resources Controlled by

This PnP BIOS can configure all of the boot and compatible devices with the use of a PnP operating system such as Windows 95.

### PCI/VGA Palette Snoop

Some non-standard VGA display cards may not show colors properly. This field allows you to set whether or not MPEG ISA/VESA VGA cards can work with PCI/VGA. When this field is enabled, a PCI/VGA can work with an MPEG ISA/VESA VGA card. When this field is disabled, a PCI/VGA cannot work with an MPEG ISA/VESA card.

### Maximum Payload Size

The default setting of the PCI Express Maximum Payload Size is 4096.

## PC Health Status

This section shows the parameters in determining the PC Health Status. These parameters include temperatures, fan speeds and voltages.

Phoenix - AwardBIOS CMOS Setup Utility
PC Health Status

| | | ITEM HELP |
|---|---|---|
| Shutdown Temperature | Disabled | |
| CPU Warning Temperature | Disabled | |
| System Temp | 45°C/113°F | |
| CPU TEMP | 45°C/113°F | Menu Level > |
| FAN2 Speed | 5400 RPM | |
| FAN1 Speed | 5400 RPM | |
| Vcore(V) | 1.02 V | |
| +12 V | 1.32 V | |
| Vmem | 1.8V | |
| +5V | 5.25 V | |
| 3.3V | 3.37V | |
| VBAT (V) | 3.21 V | |
| 5VSB(V) | 5.67 V | |
| **Smart Fan 1** | | |
| 1st Smart Fan Temperature | Disabled | |
| Fan1 Tolerance Vale | 5 | |
| 2nd Smart Fan Temperature | Disabled | |
| Fan2 Tolerance Vale | 5 | |

### CPU Warning Temperature

This field allows the user to set the temperature so that when the temperature is reached, the system sounds a warning. This function can help prevent damage to the system that is caused by overheating.

### Temperatures/Voltages

These fields are the parameters of the hardware monitoring function feature of the motherboard. The values are read-only values as monitored by the system and show the PC health status.

### Smart Fan Temperature

There are two smart fan functions available. When enabled, the user is allowed to set a threshold temperature which determines when the CPU/system fan would stop rotating.

## Frequency/Voltage Control

This section shows the user how to configure the processor frequency.

Phoenix - AwardBIOS CMOS Setup Utility
Frequency/Voltage Control

| | | |
|---|---|---|
| Auto Detect PCI Clk | Disabled | ITEM HELP |
| Spreed Spectrum | Disabled | |
| CPU Host/SRC PCI Clock | Default | |

### Auto Detect PCI Clk

This field enables or disables the auto detection of the PCI clock.

### Spread Spectrum Modulated

This field sets the value of the spread spectrum. The default setting is ***Disabled***. This field is for CE testing use only.

### CPU Host / SRC PCI Clock

This field is set to ***Default***.

## Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

## Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

## Set Supervisor Password

These two options set the system password. Supervisor Password sets a password that will be used to protect the system and Setup utility. User Password sets a password that will be used exclusively on the system. To specify a password, highlight the type you want and press <Enter>. The Enter Password: message prompts on the screen. Type the password, up to eight characters in length, and press <Enter>. The system confirms your password by asking you to type it again. After setting a password, the screen automatically returns to the main screen.

To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

## Save & Exit Setup

This option allows you to determine whether or not to accept the modifications. If you type "Y", you will quit the setup utility and save all changes into the CMOS memory. If you type "N", you will return to Setup utility.

## Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing "Y" will quit the Setup utility without saving the modifications. Typing "N" will return you to Setup utility.

## Load Fail-Safe Defaults

This option allows you to load the troubleshooting default values permanently stored in the BIOS ROM. These default settings are non-optimal and disable all high-performance features.

## Load Optimized Defaults

This option allows you to load the default values to your system configuration. These default settings are optimal and enable all high performance features.

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To disable a password, just press the <Enter> key when you are prompted to enter the password. A message will confirm the password to be disabled. Once the password is disabled, the system will boot and you can enter Setup freely.

## Save & Exit Setup

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## Exit Without Saving

Select this option to exit the Setup utility without saving the changes you have made in this session. Typing “Y” will quit the Setup utility without saving the modifications. Typing “N” will return you to Setup utility.

# Drivers Installation

This section describes the installation procedures for software and drivers under the Windows 2000 and Windows XP. The software and drivers are included with the motherboard. If you find the items missing, please contact the vendor where you made the purchase. The contents of this section include the following:

Intel Chipset Software Installation Utility ..... 48
VGA Drivers Installation..... 50
Realtek High Definition Audio Driver Installation..... 52
LAN Drivers Installation ..... 53

**IMPORTANT NOTE:**
After installing your Windows operating system (Windows 2000/ XP), you must install first the Intel Chipset Software Installation Utility before proceeding with the drivers installation.

# Intel Chipset Software Installation Utility

The Intel Chipset Drivers should be installed first before the software drivers to enable Plug & Play INF support for Intel chipset components. Follow the instructions below to complete the installation under Windows 2000/XP.

1. Insert the CD that comes with the board. Click ***Intel Chipsets*** and then ***Intel(R) I945GM/GME/GSE Chipset Drivers***.

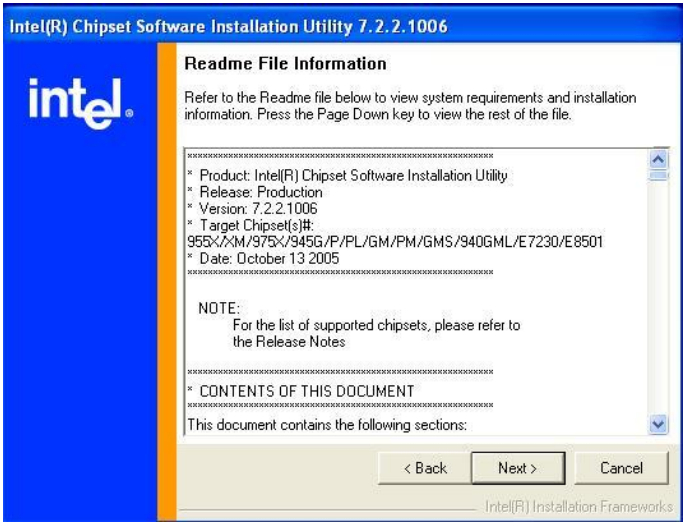
2. Click ***Intel(R) Chipset Software Installation Utility.***

Inside This CD...
Version : 8.2.1D
Intel
VIA
ALi/ATi/AMD
VGA Card
LAN Card
SCSI/SATA Card
Tools
Intel(R) Chipset Software Installation Utility
Intel(R) I945GM/GME/GSE Chipset Family Graphic
Realtek Audio Driver
Intel(R) PRO LAN Network Drivers
Update Windows OS with Plug and Play feature and allow the OS to correctly identify the Intel chipset components and properly configure

3. When the Welcome screen to the Intel(R) Chipset Software Installation Utility appears, click ***Next*** to continue.

4. Click ***Yes*** to accept the software license agreement and proceed with the installation process.

5. In the Readme File Information window, click ***Next*** to continue to proceed with the installation process.


Intel(R) Chipset Software Installation Utility 7.2.2.1006
intel
Readme File Information
Refer to the Readme file below to view system requirements and installation information. Press the Page Down key to view the rest of the file.
* Product: Intel(R) Chipset Software Installation Utility
* Release: Production
* Version: 7.2.2.1006
* Target Chipset(s)#:
955X/XM/975X/945G/P/PL/GM/PM/GMS/940GML/E7230/E8501
* Date: October 13 2005
NOTE:
For the list of supported chipsets, please refer to the Release Notes
* CONTENTS OF THIS DOCUMENT
This document contains the following sections:
< Back
Next >
Cancel
Intel(R) Installation Frameworks

6. The utility setup is now complete. Click ***Finish*** to restart the computer.

# VGA Drivers Installation

To install the VGA drivers, follow the steps below to proceed with the installation.

1. Insert the CD that comes with the board. Click ***Intel Chipsets*** and then ***Intel(R) I945GM/GME/GSE Chipset Drivers***. Then, click ***Intel(R) I945GM/GME/GSE Chipset Family Graphics Driver***.

2. When the Welcome screen to the Setup Program appears, click ***Next*** to continue.

3. Click ***Yes*** to to agree with the license agreement and continue the installation process.

4. On Readme File Information screen, click ***Next*** to continue.

5. In the Setup Progress screen, click ***Next*** to continue the installation.

6. Setup is now complete. Click ***Finish*** to restart the computer.

Intel® Graphics Media Accelerator Driver
Intel® Graphics Media Accelerator Driver
Setup Is Complete
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

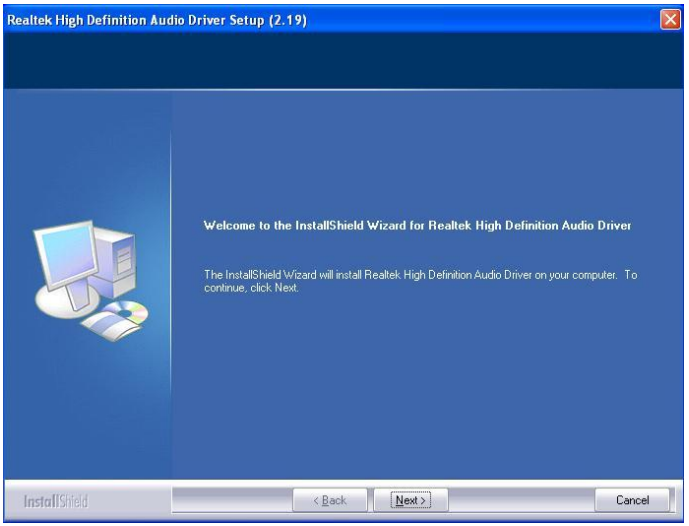
# Realtek High Definition Audio Driver Installation

Follow the steps below to install the Realtek AC97 Codec Audio Drivers.

1. Insert the CD that comes with the motherboard. Click ***Intel Chipsets*** and then ***Intel(R) I945GM/GME/GSE Chipset Drivers***. Click ***Realtek Audio Driver.***

2. Click ***Realtek Audio Driver*** and then ***Realtek High Definition Codec Audio Driver***

3. When the Welcome to the InstallShield Wizard to Realtek High Definition Audio Driver screen appears, click ***Next*** to continue.


Realtek High Definition Audio Driver Setup (2.19)
Welcome to the InstallShield Wizard for Realtek High Definition Audio Driver
The InstallShield Wizard will install Realtek High Definition Audio Driver on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

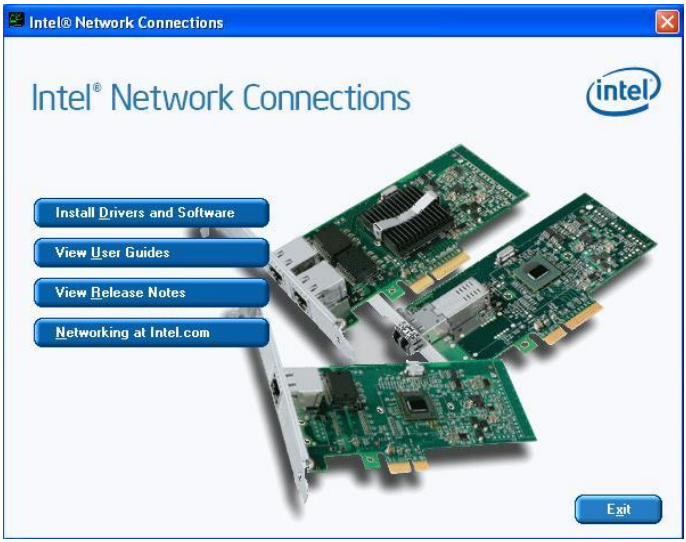
4. Setup has finished installing Realtek High Definition Audio Driver on your computer. Click ***Finish*** to restart the computer.

# LAN Drivers Installation

Follow the steps below to install the **Intel 82574L LAN Drivers**.

1. Insert the CD that comes with the board. Click ***LAN Card*** and then ***Intel(R) PRO 82574L LAN Drivers***.

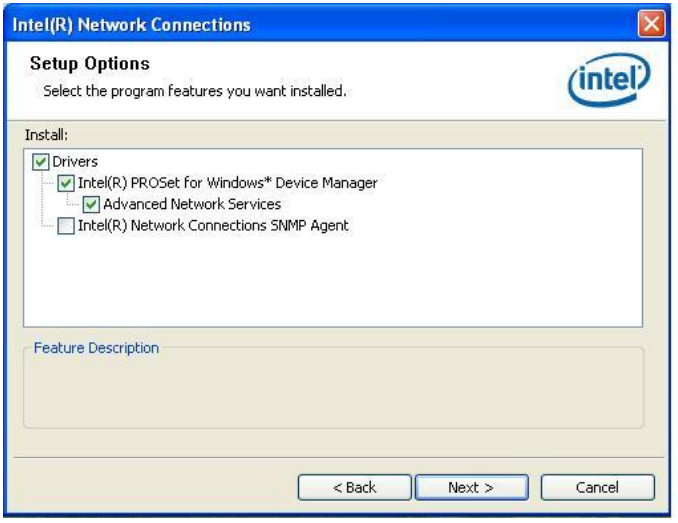
2. In the next screen, click ***Install Drivers and Software***.



3. In the Welcome screen to the InstallShield Wizard for Intel(R) Network Connections, click ***Next***.

4. In the License Agreement screen, click ***Next*** to accept the terms in the license agreement.

5. In the Setup Options screen, click the checkbox of Drivers to select it and then click ***Next***.




6. In the Ready to Install the Program screen, click ***Install*** to begin installation of the drivers.

7. When the InstallShield Wizard has been completed, click ***Finish***.

# Appendix

## A. I/O Port Address Map

Each peripheral device in the system is assigned a set of I/O port addresses which also becomes the identity of the device. The following table lists the I/O port addresses used.

| Address | Device Description |
|---|---|
| 000h - 01Fh | DMA Controller #1 |
| 020h - 03Fh | Interrupt Controller #1 |
| 040h - 05Fh | Timer |
| 060h - 06Fh | Keyboard Controller |
| 070h - 07Fh | Real Time Clock, NMI |
| 080h - 09Fh | DMA Page Register |
| 0A0h - 0BFh | Interrupt Controller #2 |
| 0C0h - 0DFh | DMA Controller #2 |
| 0F0h | Clear Math Coprocessor Busy Signal |
| 0F1h | Reset Math Coprocessor |
| 1F0h - 1F7h | IDE Interface |
| 278 - 27F | Parallel Port #2(LPT2) |
| 2F8h - 2FFh | Serial Port #2(COM2) |
| 2B0 - 2DF | Graphics adapter Controller |
| 378h - 3FFh | Parallel Port #1(LPT1) |
| 360 - 36F | Network Ports |
| 3B0 - 3BF | Monochrome & Printer adapter |
| 3C0 - 3CF | EGA adapter |
| 3D0 - 3DF | CGA adapter |
| 3F0h - 3F7h | Floppy Disk Controller |
| 3F8h - 3FFh | Serial Port #1(COM1) |

# B. Interrupt Request Lines (IRQ)

Peripheral devices use interrupt request lines to notify CPU for the service required. The following table shows the IRQ used by the devices on board.

| Level | Function |
|---|---|
| IRQ0 | System Timer Output |
| IRQ1 | Keyboard |
| IRQ2 | Interrupt Cascade |
| IRQ3 | Serial Port #2 |
| IRQ4 | Serial Port #1 |
| IRQ5 | Reserved |
| IRQ6 | Floppy Disk Controller |
| IRQ7 | Parallel Port #1 |
| IRQ8 | Real Time Clock |
| IRQ9 | Reserved |
| IRQ10 | Reserved |
| IRQ11 | Reserved |
| IRQ12 | PS/2 Mouse |
| IRQ13 | 80287 |
| IRQ14 | Primary IDE |
| IRQ15 | Secondary IDE |

# C. Watchdog Timer Configuration

The WDT is used to generate a variety of output signals after a user programmable count. The WDT is suitable for use in the prevention of system lock-up, such as when software becomes trapped in a deadlock. Under these sorts of circumstances, the timer will count to zero and the selected outputs will be driven. Under normal circumstance, the user will restart the WDT at regular intervals before the timer counts to zero.

SAMPLE CODE:

```
//=====================================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//=====================================================================================
#include <stdio.h>
#include <stdlib.h>
#include "W627EHF.H"
//=====================================================================================
int main (int argc, char *argv[]);
void copyright(void);
void EnableWDT(int);
void DisableWDT(void);
//=====================================================================================
int main (int argc, char *argv[])
{
        unsigned char bBuf;
        unsigned char bTime;
        char **endptr;

        copyright();

        if (argc != 2)
        {
                printf(" Parameter incorrect!!\n");
                return 1;
        }

        if (Init_W627EHF() == 0)
        {
                printf(" Winbond 83627HF is not detected, program abort.\n");
                return 1;
        }
        bTime = strtol (argv[1], endptr, 10);
        printf("System will reset after %d seconds\n", bTime);

        EnableWDT(bTime);

        return 0;
}
//=====================================================================================
```

```
void copyright(void)
{
        printf("\n========= Winbond 83627EHF Watch Timer Tester (AUTO DETECT) ========\n"\
                        "       Usage : W627E_WD reset_time\n"\
                        "       Ex : W627E_WD 3  => reset system after 3 second\n"\
                        "            W627E_WD 0  => disable watch dog timer\n");
}
//============================================================================
void EnableWDT(int interval)
{
        unsigned char bBuf;

        bBuf = Get_W627EHF_Reg( 0x2D);
        bBuf &= (!0x01);
        Set_W627EHF_Reg( 0x2D, bBuf);                   //Enable WDTO

        Set_W627EHF_LD( 0x08);                          //switch to logic device 8
        Set_W627EHF_Reg( 0x30, 0x01);                   //enable timer

        bBuf = Get_W627EHF_Reg( 0xF5);
        bBuf &= (!0x08);
        Set_W627EHF_Reg( 0xF5, bBuf);                   //count mode is second

        Set_W627EHF_Reg( 0xF6, interval);               //set timer
}
//============================================================================
void DisableWDT(void)
{
        Set_W627EHF_LD(0x08);                           //switch to logic device 8
        Set_W627EHF_Reg(0xF6, 0x00);                    //clear watchdog timer
        Set_W627EHF_Reg(0x30, 0x00);                    //watchdog disabled
}
//============================================================================
```

```
//=============================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//=============================================================================
#include "W627EHF.H"
#include <dos.h>
//=============================================================================
unsigned int W627EHF_BASE;
void Unlock_W627EHF (void);
void Lock_W627EHF (void);
//=============================================================================
unsigned int Init_W627EHF(void)
{
	unsigned int result;
	unsigned char ucDid;

	W627EHF_BASE = 0x2E;
	result = W627EHF_BASE;

	ucDid = Get_W627EHF_Reg(0x20);
	if (ucDid == 0x88)
	{	goto Init_Finish;	}

	W627EHF_BASE = 0x4E;
	result = W627EHF_BASE;
	ucDid = Get_W627EHF_Reg(0x20);
	if (ucDid == 0x88)
	{	goto Init_Finish;	}

	W627EHF_BASE = 0x00;
	result = W627EHF_BASE;

Init_Finish:
	return (result);
}
//=============================================================================
void Unlock_W627EHF (void)
{
	outportb(W627EHF_INDEX_PORT, W627EHF_UNLOCK);
	outportb(W627EHF_INDEX_PORT, W627EHF_UNLOCK);
}
//=============================================================================
void Lock_W627EHF (void)
{
	outportb(W627EHF_INDEX_PORT, W627EHF_LOCK);
}
//=============================================================================
void Set_W627EHF_LD( unsigned char LD)
{
	Unlock_W627EHF();
	outportb(W627EHF_INDEX_PORT, W627EHF_REG_LD);
	outportb(W627EHF_DATA_PORT, LD);
	Lock_W627EHF();
}
```

```
//============================================================================
void Set_W627EHF_Reg( unsigned char REG, unsigned char DATA)
{
        Unlock_W627EHF();
        outportb(W627EHF_INDEX_PORT, REG);
        outportb(W627EHF_DATA_PORT, DATA);
        Lock_W627EHF();
}
//============================================================================
unsigned char Get_W627EHF_Reg(unsigned char REG)
{
        unsigned char Result;
        Unlock_W627EHF();
        outportb(W627EHF_INDEX_PORT, REG);
        Result = inportb(W627EHF_DATA_PORT);
        Lock_W627EHF();
        return Result;
}
//============================================================================
```

```
//============================================================================
//
// THIS CODE AND INFORMATION IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY
// KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE
// IMPLIED WARRANTIES OF MERCHANTABILITY AND/OR FITNESS FOR A PARTICULAR
// PURPOSE.
//
//============================================================================
#ifndef __W627EHF_H
#define __W627EHF_H                     1
//============================================================================
#define W627EHF_INDEX_PORT              (W627EHF_BASE)
#define W627EHF_DATA_PORT               (W627EHF_BASE+1)
//============================================================================
#define W627EHF_REG_LD                  0x07
//============================================================================
#define W627EHF_UNLOCK                          0x87
#define W627EHF_LOCK                    0xAA
//============================================================================
unsigned int Init_W627EHF(void);
void Set_W627EHF_LD( unsigned char);
void Set_W627EHF_Reg( unsigned char, unsigned char);
unsigned char Get_W627EHF_Reg( unsigned char);
//============================================================================
#endif  //__W627EHF_H
```